

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

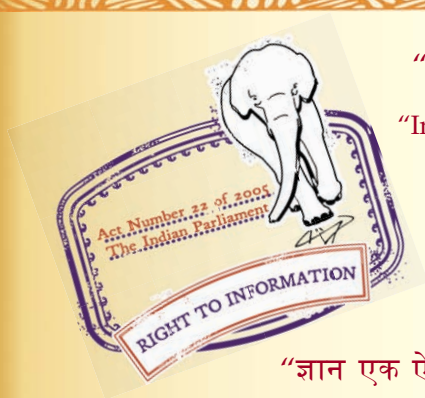
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 10532-3 (1983): Fire-resistant Hydraulic Fluids, Part 3: Water Glycol Type [PCD 3: Petroleum, Lubricants and their Related Products]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



IS : 10532 (Part 3) - 1983
(Reaffirmed 1988)

Indian Standard
SPECIFICATION FOR
FIRE-RESISTANT HYDRAULIC FLUIDS

PART 3 WATER GLYCOL TYPE

(First Reprint JANUARY 2000)

UDC 621.892.099.2 : 620.193.5

© Copyright 1983

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

AMENDMENT NO. 1 JULY 1988

TO

IS:10532(Part 3)-1983 SPECIFICATION FOR
FIRE-RESISTANT HYDRAULIC FLUIDS

PART 3 WATER GLYCOL TYPE

(Page 6, clause 5.1) - Add the following new clause after 5.1:

'5.2 Criteria for Conformity

5.2.1 The lot shall be declared as conforming to the requirements of the specification if all the test results on the composite sample meet the relevant specification requirements.'

(PCDC 4)

AMENDMENT NO. 2 JULY 1996
TO
IS 10532 (Part 3) : 1983 SPECIFICATION FOR
FIRE-RESISTANT HYDRAULIC FLUIDS

PART 3 WATER GLYCOL TYPE

[*Page 5, Table 1, Sl No. (v), col 3 and 4*] — Substitute the following for the existing:

'(3)

(4)

-9

-9'

Indian Standard

SPECIFICATION FOR FIRE-RESISTANT HYDRAULIC FLUIDS

PART 3 WATER GLYCOL TYPE

Lubricants and Related Products Sectional Committee, PCDC 4

<i>Vice-Chairman</i>	<i>Representing</i>
SHRI P. K. GOWI	Indian Oil Corporation Ltd (Research & Development Centre), Faridabad
<i>Members</i>	
SHRI A. K. ARORA	Steel Authority of India Limited (Rourkela Steel Plant), Rourkela
DR N. T. BADDI	Association of Manufacturers of Petroleum Specialities, Bombay
SHRI R. CHAKRAVARTY (<i>Alternate</i>)	
SHRI M. BHADRA	Inter-Plant Standardization in Steel Industry, Subcommittee on Oils and Lubricants, IPSS 1 : 9
SHRI P. M. BHAMBI	Indian Institute of Petroleum (CSIR), Dehra Dun
SHRI SUDHIR SINGHAL (<i>Alternate</i>)	
SHRI M. K. BHARGAVA	Petroleum Re-refiners Association of India, Madras
SHRI SHANTILAL DAYA (<i>Alternate</i>)	
SHRI S. R. BHATNAGAR	Indrol Lubricants & Specialities Ltd, Bombay
SHRI N. SETHURAMAN (<i>Alternate</i>)	
DR K. S. BHATTACHARYA	Ministry of Defence (DGI)
SHRI A. K. SINHA (<i>Alternate</i>)	
SHRI B. K. CHAPRA	Central Institute of Road Transport (Training & Research), Pune
SHRI M. H. NARURKAR (<i>Alternate</i>)	
DR D. K. DAS	National Test House, Calcutta
SHRI N. C. CHATTERJEE (<i>Alternate</i>)	
DEPUTY DIRECTOR (CHEM),	Railway Board (Ministry of Railways)
RDSO LUCKNOW	
ASSISTANT RESEARCH	
OFFICER (CHEM-I) (<i>Alternate</i>)	
SHRI G. C. GOSWAMI	Assam Oil Division, Bombay
SHRI I. CHANDRA (<i>Alternate</i>)	
SHRI J. D. HARIDAS	Tata Engineering & Locomotive Co Ltd, Jamshedpur
SHRI B. GOSWAMI (<i>Alternate</i>)	

(Continued on page 2)

© Copyright 1983

BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

IS : 10532 (Part 3) - 1983

(Continued from page 1)

<i>Members</i>	<i>Representing</i>
DR G. JAYARAMA RAO	Ministry of Petroleum, Chemicals & Fertilizers
SHRI T. P. SUBRAHMANYAM (<i>Alternate</i>)	
SHRI O. K. JUNEJA	Bharat Petroleum Corporation Ltd, Bombay
SHRI I. M. MERCHANT (<i>Alternate</i>)	
SHRI S. K. KALE	Steel Authority of India Limited (Bhilai Steel Plant), Bhilai
SHRI J. L. GROVER (<i>Alternate</i>)	
SHRI V. LOBO	Oil Co-ordination Committee, New Delhi
SHRI S. N. MATHUR (<i>Alternate</i>)	
LT GEORGE MATHREW	Naval Headquarters, New Delhi
SHRI S. R. MEHTA	Hindustan Petroleum Corporation Ltd, Bombay
SHRI P. M. RAO (<i>Alternate</i>)	
SHRI R. MUKHERJEE	Indian Oil Blending Ltd, Bombay
SHRI M. J. SHAH (<i>Alternate</i>)	
SHRI S. K. NAMBIAR	Indian Oil Corporation Ltd (Marketing Division), Bombay
SHRI B. SANGHAVI (<i>Alternate</i>)	
SHRI RAJINDER SINGH	Indian Oil Corporation Ltd (Refineries Pipelines Division), New Delhi
SHRI D. K. DAS GUPTA (<i>Alternate</i>)	
SHRI T. R. RAMAKRISHNAN	The Tata Iron & Steel Co Ltd, Jamshedpur
SHRI R. A. RAO	Lubrizol India Ltd, Bombay
SHRI K. L. MALIK (<i>Alternate</i>)	
SHRI S. V. SASTRY	The Automotive Research Association of India, Pune
SHRI B. GHOSH (<i>Alternate</i>)	
SHRI P. SATYANARAYANAN	Development Commissioner, Small Scale Industries, New Delhi
SHRI N. N. SAVANT	Petrosil Oil Co Ltd, Bombay
SHRI M. A. PAES (<i>Alternate</i>)	
SHRI D. K. SINGH	Bharat Heavy Electricals Ltd, Bhopal
SHRI R. K. GUPTA (<i>Alternate</i> I)	
SHRI T. V. SUNDERRAJAN (<i>Alternate</i> II)	
CDR K. C. SINHA	Ministry of Defence (R & D)
SHRI RAJENDRA PRASAD (<i>Alternate</i>)	
DR R. D. SRIVASTAVA	Ministry of Defence (IMS & RDE)
DR P. S. VENKATARAMANI (<i>Alternate</i>)	
SHRI T. V. VARGHESE	Madras Refineries Ltd, Madras
SHRI G. SAMBAMURTHY (<i>Alternate</i>)	
SHRI M. S. SAXENA,	Director General, ISI (<i>Ex-officio Member</i>)
Director (P & C)	

Secretary

SHRI M. A. U. KHAN
Deputy Director (P & C), ISI

Turbine, Compressor and Hydraulic Oils Subcommittee, PCDC 4 : 11

Convener

SHRI K. S. ANAND

Indian Oil Corporation Ltd (Research & Development Centre), Faridabad

Members

SHRI B. RAMACHANDRAM (*Alternate to*
Shri K. S. Anand)

(Continued on page 7)

Indian Standard
**SPECIFICATION FOR
FIRE-RESISTANT HYDRAULIC FLUIDS
PART 3 WATER GLYCOL TYPE**

0. FOREWORD

0.1 This Indian Standard (Part 3) was adopted by the Indian Standards Institution on 12 April 1983, after the draft finalized by the Lubricants and Related Products Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

0.2 The use of fire-resistant hydraulic fluids is increasing due to a growing awareness of the dangers inherent in using mineral oils for applications where there is a fire risk. There are four types of fire-resistant hydraulic fluids, namely, dilute emulsions, invert emulsions, water glycols and synthetic fluids. Water glycols are true solutions of water, glycols and high molecular mass thickeners to increase viscosity. Additives, such as antiwear, anti-corrosion, antioxidant and antifoam are also added to obtain improved performance. In view of being true solutions, their stability characteristics are good. Their working temperatures are -10 to $+60^{\circ}\text{C}$. These are normally compatible with all kinds of seals, hoses and gaskets commonly used in mineral oil systems. Use of magnesium, cadmium and zinc metals should be avoided with these systems.

0.3 Other parts of the standard published so far are as follows:

(Part 1)-1983 Dilute emulsions for powered supports

(Part 2)-1983 Invert emulsions (water-in-oil) type

(Part 4)-1983 Phosphate esters type

0.4 Selection and use of the fire-resistant hydraulic fluids are covered in IS : 10531-1983* while determination of their fire-resistant characteristics is given in IS : 7895-1975†.

*Code of practice for selection and use of fire-resistant hydraulic fluids.

†Tests for fire-resistant characteristics of hydraulic fluids used in mining machinery.

IS : 10532 (Part 3) - 1983

0.5 In the preparation of this standard considerable assistance has been derived from NCB Specification No. 570/1970 published by the National Coal Board, U.K.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part 3) prescribes the requirements and methods of sampling and test for fire-resistant hydraulic fluids, water glycol type suitable for use in hydraulic systems.

2. GRADES

2.1 The material shall be in two viscosity grades namely, VG 22 and VG 46 designated as HF — C 22 and HF — C 46 respectively.

3. REQUIREMENTS

3.1 Description — The material shall be a clear fluid, free from foreign matter, sediment and visible impurities. It shall not contain any ingredients injurious to persons using or handling it.

3.2 Composition — The material shall be composed of glycols, polymeric thickeners, water and additives necessary for desirable antiwear, anticorrosive and antifoaming properties. It shall not be corrosive to ferrous and non-ferrous metals.

3.3 The material shall also comply with the requirements prescribed in Table 1, when tested according to the appropriate methods specified in col 5 of the table.

4. PACKING AND MARKING

4.1 Packing — The material shall be packed in suitable containers as agreed to between the purchaser and the supplier. Galvanized drums/barrels shall not be used for packing these fluids.

*Rules for rounding off numerical values (*revised*).

TABLE 1 REQUIREMENTS FOR FIRE-RESISTANT HYDRAULIC FLUIDS—WATER GLYCOL TYPE

(Clause 3.3)

Sl. No.	CHARACTERISTIC	REQUIREMENT		METHODS OF TEST, REF TO (P :) METHODS OF IS : 1448*
		Grade HF-C 22	Grade HF-C 46	
(1)	(2)	(3)	(4)	(5)
i)	Appearance	Clear, practically colourless	Clear, practically colourless	—
ii)	Kinematic viscosity, cSt at 40°C	19.8 to 24.2	41.4 to 50.6	P : 25
iii)	pH value	8.5 to 10.5	8.5 to 10.5	IS : 5741-1970†
iv)	Foaming stability, ml, at 24°C	Nil	Nil	P : 67
v)	Pour Point, °C, Max	— 10	— 10	P : 10
vi)	Relative density at 15°/15°C	1.05 to 1.09	1.05 to 1.09	P : 32
vii)	Water content, percent by volume	40 to 60	40 to 45	P : 40
viii)	Rust preventive characteristics	Shall pass the test after 24 h		P : 96‡
ix)	Pump wear test:			
	a) Total ring and vane mass loss, mg, Max	500	500	P : §
	b) Fire resistant characteristics	Shall pass the test A, B and C		IS : 7895-1975

*Methods of test for petroleum and its products.

†Methods for determination of pH.

‡Fluid alone is to be taken for this test.

§Under preparation. Till such time ASTM D 2882-74 may be followed.

||Tests for fire resistant characteristics of hydraulic fluids used in mining machinery.

4.1.1 The containers, together with associated bungs, caps, seals and other fittings shall not be made from aluminium, magnesium or titanium nor from alloys containing these metals as major constituents. The containers and their fittings shall not be painted with aluminium paints.

IS : 10532 (Part 3) - 1983

4.1.2 The internal cleanliness of all containers before they are filled shall be of a high standard. Any coating of the internal surfaces of the barrels shall have no deleterious effect on the fluid.

4.2 Marking — The containers shall be securely closed and marked with the name of manufacturer; name, type, grade and mass of the material; recognized trade-mark if any; and with identification in code or otherwise to enable the lot of consignment or manufacture to be traced back; and the instructions for use.

4.2.1 The containers may also be marked with the Standard Mark.

4.2.2 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

5. SAMPLING

5.1 Representative samples of the material shall be drawn as prescribed in IS : 1447-1966*.

6. STORAGE

6.1 The material shall be stored and handled, strictly in accordance with the suppliers instructions.

*Methods of sampling of petroleum and its products.

(Continued from page 2)

<i>Members</i>	<i>Representing</i>
SHRI A. K. ABORA	Steel Authority of India Limited (Rourkela Steel Plant), Rourkela
SHRI M. K. BHARGAVA	Petroleum Re-refiners Association of India, Madras
SHRI SHANTILAL DAYA (<i>Alternate</i>)	
SHRI S. R. BHATNAGAR	Indrol Lubricants & Specialities Ltd, Bombay
SHRI N. SETHURAMAN (<i>Alternate</i>)	
SHRI B. K. CHAPRA	Central Institute of Road Transport (Training & Research), Pune
SHRI M. H. NARURKAR (<i>Alternate</i>)	
SHRI N. C. CHATTERJEE	National Test House, Calcutta
SHRI S. A. DHIR	Lubrizol India Ltd, Bombay
SHRI R. A. RAO (<i>Alternate</i>)	
SHRI O. K. JUNEJA	Bharat Petroleum Corporation Ltd, Bombay
SHRI G. BALAKRISHNAN (<i>Alternate</i>)	
SHRI A. N. KARMARKAR	Automobile Products of India Ltd, Bombay
SHRI S. R. MEHTA	Hindustan Petroleum Corporation Ltd, Bombay
SHRI P. KRISHNAMOORTHY (<i>Alternate</i>)	
SHRI D. M. MERCHANT	Bhavnagar Oil & Chemical Industries Pvt Ltd, Bombay
SHRI A. F. J. BAPLIST (<i>Alternate</i>)	
SHRI R. MUKHERJI	Indian Oil Blending Ltd, Bombay
SHRI M. J. SHAH (<i>Alternate</i>)	
SHRI P. N. PATEL	Association of Manufacturers of Petroleum Specialities, Bombay
SHRI K. K. NEYOGI (<i>Alternate</i>)	
SHRI V. RAMACHANDRAN	Brakes India Ltd, Madras
SHRI P. KRISHNAMOORTHY (<i>Alternate</i>)	
REPRESENTATIVE	Directorate General of Mines Safety, Dhanbad
SHRI B. SANGHAVI	Indian Oil Corporation Ltd (Marketing Division), Bombay
SHRI B. LAXMINARAYANAN (<i>Alternate</i>)	
SHRI N. N. SAVANT	Petrosil Oil Co Ltd, Bombay
SHRI M. A. PAES (<i>Alternate</i>)	
DR A. SETHURAMIAH	Indian Institute of Petroleum (CSIR), Dehra Dun
SHRI S. K. JAIN (<i>Alternate</i>)	
SHRI K. B. SHRIVASTAVA	Tide Water Oil Co (India) Ltd, Calcutta
SHRI J. NAIK (<i>Alternate</i> I)	
SHRI N. C. MITTAL (<i>Alternate</i> II)	
SHRI D. K. SINGH	Bharat Heavy Electricals Ltd, Bhopal
SHRI G. ACHUTARAMAIAH (<i>Alternate</i> I)	
SHRI B. S. SRIVASTAVA (<i>Alternate</i> II)	
SHRI G. P. SINGH	Steel Authority of India Limited (Bokaro Steel Plant), Bokaro Steel City
SHRI A. K. MISRA (<i>Alternate</i>)	
SHRI J. P. SIRPAL	Naval Headquarters, New Delhi
SHRI A. P. GOEL (<i>Alternate</i>)	
DR R. D. SRIVASTAVA	Ministry of Defence (DGI)
SHRI RAJENDRA SINGH (<i>Alternate</i>)	
SHRI T. V. VARGHESE	Madras Refineries Ltd, Madras
SHRI P. C. D. G. SAMUEL (<i>Alternate</i>)	

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones 323 0131, 323 3375, 323 9402

Fax 91 11 3234062, 91 11 3239399, 91 11 3239382

Telegrams Manaksanstha
(Common to all Offices)

Central Laboratory:

Plot No 20/9, Site IV, Sahibabad Industrial Area, SAHIBABAD 201010

Telephone
8-77 00 32

Regional Offices:

Central	Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	323 76 17
*Eastern	1/14 CIT Scheme VII M, V I P Road, Maniktoia, CALCUTTA 700054	337 86 62
Northern	SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43
Southern	C I T Campus, IV Cross Road, CHENNAI 600113	235 23 15
†Western	Manakalaya, E9 Behind Marol Telephone Exchange, Andheri (East), MUMBAI 400093	832 92 95

Branch Offices:

'Pushpak',	Nurmohamed Shaikh Marg Khanpur, AHMEDABAD 380001	550 13 48
‡Peenya	Industrial Area, 1st Stage, Bangalore - Tumkur Road BANGALORE 560058	839 49 55
Gangotri	Complex, 5th Floor, Bhadbhada Road, T T Nagar BHOPAL 462003	55 40 21
Plot No 62-63,	Unit VI Ganga Nagar, BHUBANESHWAR 751001	40 36 27
Kalaikathir	Buildings, 670 Avinashi Road, COIMBATORE 641037	21 01 41
Plot No 43,	Sector 16 A Mathura Road FARIDABAD 121001	8-28 88 01
Savitri	Complex, 116 G T Road, GHAZIABAD 201001	8-71 19 96
53/5 Ward No 29,	R G Barua Road, 5th By-lane, GUWAHATI 781003	54 11 37
5-8-58C, L N	Gupta Marg, Nampally Station Road HYDERABAD 500001	20 10 83
E-52, Chitaranjan	Marg, C-Scheme, JAIPUR 302001	37 29 25
117/418 B,	Sarvodaya Nagar KANPUR 208005	21 68 76
Seth Bhawan,	2nd Floor, Behind Leela Cinema, Naval Kishore Road, LUCKNOW 226001	23 89 23
Patliputra	Industrial Estate, PATNA 800013	26 23 05
T C No 14/1421,	University P O Palayam, THIRUVANANTHAPURAM 695034	6 21 17
NIT Building,	Second Floor, Gokulpat Market, NAGPUR 440010	52 51 71
Institution of	Engineers (India) Building, 1332 Shrivaji Nagar, PUNE 411005	32 36 35
*Sales Office	is at 5 Chowringhee Approach, P O Princep Street, CALCUTTA 700072	27 10 85
†Sales Office	is at Novelty Chambers, Grant Road, MUMBAI 400007	309 65 28
‡Sales Office	is at 'F' Block, Unity Building, Narashimaraja Square, BANGALORE 560002	222 39 71